

# Important Advances in Clinical Medicine

## *Epitomes of Progress—Ophthalmology*

*The Scientific Board of the California Medical Association presents the following inventory of items of progress in ophthalmology. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in ophthalmology which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.*

*The items of progress listed below were selected by the Advisory Panel to the Section on Ophthalmology of the California Medical Association and the summaries were prepared under its direction.*

Reprint requests to: Division of Scientific and Educational Activities,  
California Medical Association, 731 Market St., San Francisco, CA 94103

### **Vitrectomy**

VITREOUS has long been considered the enemy of ophthalmic surgeons. Only a few years ago, one's skill was measured in no small degree by the ability to avoid contact with the vitreous, and the vitreous cavity itself was "off limits" to surgical intervention. Recently, this all has changed, and changing attitudes and capabilities for dealing with the vitreous are revolutionizing intraocular surgery.

In 1968 Kasner and co-workers reported the successful removal of nearly all diseased vitreous from an eye with primary amyloidosis, using his so-called open sky technique. This opened the door for new surgical techniques to remove vitreous and intraocular strands in a variety of diseases. It quickly became evident that the open sky technique had several hazards: the lens had to be removed, resulting in aphakia; there were

possible further complications of the large corneal section or corneal graft; the iris was irritated and frequently severe inflammatory reaction resulted; instruments for the procedure were usually inadequate and too large; traction on vitreous during the cutting near the iris plane was unavoidable, and collapse of the eye prevented adequate visualization of certain areas of the posterior segment.

In 1971 Machemer and associates reported their initial results on the pars plana approach to vitrectomy. Pars plana vitrectomy was developed with the following objectives in mind: To eliminate the anterior segment problems seen in open sky vitrectomy, the anterior segment should be left intact and the vitreous should be removed through a very small incision at the pars plana. To improve on instrumentation, only one miniaturized multifunction instrument should be introduced into the eye. This instrument would have to

cut and remove diseased vitreous from the eye as well as simultaneously replace the removed vitreous with clear fluid. Fiber optics were chosen to provide precise and effective internal illumination. To achieve maximum control over intraocular manipulations the instrument should be observed through the pupil under the high magnification, stereopsis, and upright imagery of an operating microscope.

Many medical centers have enthusiastically adopted procedures for removal of opaque vitreous through a pars plana incision with an instrument combining suction, cutting and infusion of a replacement solution. The most common indication for vitrectomy has been the presence of a long-standing severe vitreous hemorrhage in eyes with proliferative diabetic retinopathy.

Vitrectomy often is followed by rapid, substantial improvement in visual acuity from low preoperative levels, and these results have been sufficient to convince most clinicians of the value of the procedure without a controlled study. To document the validity of this impression, the National Eye Institute gathered and pooled data on the experience of six clinics at which vitrectomy is done. The data show that over 41 percent of 145 eyes which had visual acuity of less than 5/200 and in which severe vitreous hemorrhage had been present for a year or more achieved visual acuity of 20/200 or better four to nine months after pars plana vitrectomy. Although no corresponding control data are available, data from the Airlie House Symposium on the Treatment of Diabetic Retinopathy, as reanalyzed by Caird and Draper (unpublished data), show that in a group of 58 eyes with visual acuity of less than 20/200 and vitreous hemorrhage severe enough to preclude observation of the fundus, the rate of recovery to 20/200 or better after one year without treatment was only about 8 percent.

In most of the large series of reported results of pars plana vitrectomies in the literature since the introduction of the pars plana technique, about 50 percent have been for the late complications of proliferative diabetic retinopathy. A new prospective, randomized, controlled clinical trial of vitrectomy in the treatment of diabetic retinopathy has been initiated by the National Eye Institute. The study's purpose is to compare vitrectomy done soon after severe vitreous hemorrhage in eyes with proliferative diabetic retinopathy and vitrectomy done a year after the occur-

rence of hemorrhage, as is now generally practiced. The study's protocol has been prepared and patient enrollment will soon begin.

ROBERT D. STONE, MD

#### REFERENCES

- Kasner D: Vitrectomy: A new approach to the management of vitreous. *Highlights Ophthalmol* 11:304-390, May-Jun 1968
- Machemer R, Buettner H, Norton EWD: Vitrectomy: A pars plana approach. *Trans Am Acad Ophthalmol Otolaryngol* 75:813-820, Jul-Aug 1971
- Machemer R: Vitrectomy—A Pars Plana Approach. *Current Ophthalmology Monographs*. New York, Grune and Stratton, Inc., 1975
- Irvine AR, O'Malley C (Eds): *Advances in Vitreous Surgery*. Springfield, Charles C Thomas, 1976
- Mandelcorn MS, Blankenship G, Machemer R: Pars plana vitrectomy for the management of severe diabetic retinopathy. *Am J Ophthalmol* 81:561-570, May 1976

## Intraocular Lens Implantation

THE MODERN HISTORY of intraocular lens implantation began on November 29, 1949, when Harold Ridley inserted the first intraocular lens. Although complications related to use of this type of lens occurred far too frequently and its use was soon abandoned, numerous intraocular lenses were developed and used clinically in the years thereafter. The overall results and complications of intraocular lens implantation may be assessed by reviewing Binkhorst's cumulative experience with 795 Binkhorst iris clip lens implantations and 170 Binkhorst iridocapsular lens implantations done on 717 patients between 1958 and 1972.

Disadvantages of intraocular lens implantation relate to the increased likelihood of surgical complications associated with a more complex procedure; the tendency of surgical and immediately postoperative complications to have a more profound effect on an eye with an intraocular lens; the occurrence of complications directly related to the lens, such as lens dislocation; the occurrence of late corneal dystrophy, the incidence of which is probably greater than that following conventional cataract surgical procedures; the occurrence of macular cystoid degeneration in an incidence that may be greater than that following conventional cataract surgical operation, and possible late complications related to alterations in or toxicity of intraocular lens implant materials.

From a careful evaluation of the advantages and disadvantages of intraocular lens implantation, the indications and contraindications may be derived. This topic, however, is controversial, because appropriate scientific data on the long-term